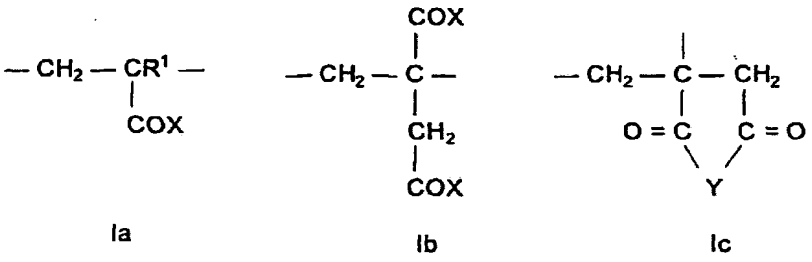
Claims

1. Copolymers based on unsaturated mono- or dicarboxylic acid derivatives and oxyalkyleneglycol alkenyl ethers, characterised in that they contain

a) from 25 to 98.99 mol % of the structural groups of formula Ia and/or Ib and/or Ic



Ia Ib Ic

wherein R^1 represents hydrogen or an aliphatic hydrocarbon radical having from 1 to 20 C atoms

X represents $-OM_a$, $-O-(C_mH_{2m}O)_n-R^2$, $-NH-(C_mH_{2m}O)_nR^2$

M represents hydrogen, a mono- or divalent metal cation, an ammonium ion, an organic amine radical,

a represents ½ or 1

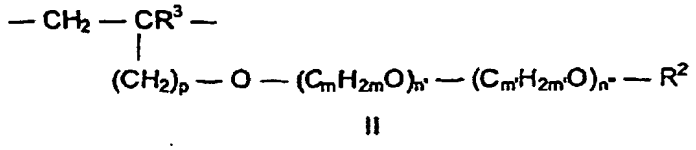
R^2 represents hydrogen, an aliphatic hydrocarbon radical having from 1 to 20 C atoms, a cycloaliphatic hydrocarbon radical having from 5 to 8 C atoms, an optionally substituted aryl radical having from 6 to 14 C atoms,

Y represents O, NR^2

m represents 2 to 4

n represents 0 to 200

b) from 1 to 48.9 mol% of the structural group of general formula II



II

wherein R^3 represents hydrogen or an aliphatic hydrocarbon radical having from 1 to 5 C atoms

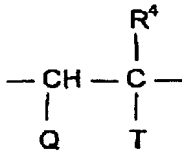
m' represents 2 to 4

n' + n" represents 250 to 500

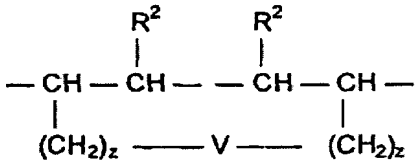
p represents 0 to 3

R^2 and m have the above-mentioned meaning,

c) from 0.01 to 6 mol% of structural groups of formula IIIa or IIIb



IIIa



IIIb

wherein Q represents –H, -$COOM_a$, -$COOR^5$

T represents $-U^1-(CH-CH_2-O)_x-(CH_2-CH_2-O)_y-R^6$

CH_3

$(CH_2)_z-V-(CH_2)_z-CH=CH-R^2$

-$COOR^5$ when S = -$COOR^5$ or -$COOM_a$

U^1 represents -CO-NH-, -O-, -CH_2O-

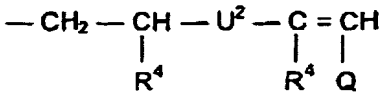
U^2 represents -NH-CO-, -O-, -OCH_2-

V represents -O-CO-C_6H_4-CO-O

R^4 represents H, CH_3

R^5 represents an aliphatic hydrocarbon radical having from 3 to 20 C atoms, a cycloaliphatic hydrocarbon radical having from 5 to 8 C atoms, an aryl radical having from 6 to 14 C atoms.

$R^6 = R^2$,

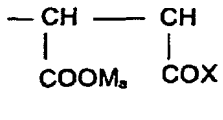


z represents 0 to 4

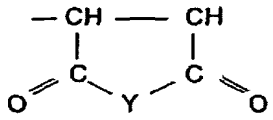
x represents 1 to 150

y represents 0 to 15

d) from 0 to 60 mol of structural groups of general formula IVa and/or IVb



IVa



IVb

with the aforementioned meaning for a, M, X and Y.

2. Copolymers according to claim 1, characterised in that R^1 represents a methyl radical.

3. Copolymers according to either claim 1 or claim 2, characterised in that M represents a mono- or divalent metal cation selected from the group of sodium, potassium, calcium or magnesium ions.

4. Copolymers according to any one of claims 1 to 3, characterised in that when R^2 represents phenyl, the phenyl radical is further substituted by hydroxyl, carboxyl or sulphonic acid groups.

5. Copolymers according to any one of claims 1 to 4, characterised in that in formula Ia n represents 1 to 150.

6. Copolymers according to any one of claims 1 to 5, characterised in that in formula II, p represents 0 and m represents 2.

7. Copolymers according to any one of claims 1 to 6, characterised in that they contain from 70 to 94.98 mol% of structural groups of formula Ia and/or Ib and/or Ic, from 5 to 25 mol% of structural groups of formula II, from 0.02 to 2 mol% of structural groups of formula IIIa and/or IIIb and from 0 to 24.98 mol% of structural groups of formula IVa and/or IVb.

8. Copolymers according to any one of claims 1 to 7, characterised in that they also contain up to 50mol%, in particular up to 20 mol%, based on the total of the structural groups of formulae I, II, III and IV, of structural groups, the monomers of which represent a vinyl or (meth)acrylic acid derivative.

9. Copolymers according to claim 8, characterised in that styrene, α-methlystyrene, vinyl acetate, vinyl propionate, ethylene, propylene, isobuteane, N-vinylpyrrolidone, allylsulphonic acid, methallylsulphonic acid, vinyl sulphonic acid or vinyl phosphonic acid are used as the monomeric vinyl derivative.

10. Copolymer according to claim 9, characterised in that hydroxyalkyl(meth)acrylate, acrylamide, methacrylamide, AMPS, methylmethacylate, methylacrylate, butylacrylate or cyclohexylacrylate are used as the monomeric (meth)acrylic acid derivative.

11. Copolymers according to any one of claims 1 to 10, characterised in that they have an average molecular weight of from 1,000 to 100,000 g/mol.

12. Process for the production of the copolymers according to any one of claims 1 to 11, characterised in that from 25 to 98.99 mol% of an unsaturated mono- or diocarboxylic acid derivative, from 1 to 48.9 mol% of an oxyalkyleneglycol alkenylether, 0.01 to 6 mol% of a vinyl polyalkyleneglycol compound or ester compound and from 0 to 60 mol% of a dicarboxylic acid derivative are polymerised using a radical initiator.

13. Process according to claim 12, characterised in that from 70 to 94.88 mol% of an unsaturated mono- or diocarboxylic acid derivative, from 5 to 25 mol% of an oxyalkyleneglycol alkenylether, from 0.02 to 2 mol% of a vinyl polyalkyleneglycol

compound or ester compound and from 0 to 24.98 mol% of a dicarboylic acid derivative are used.

14. Process according to either claim 12 or claim 13, characterised in that up to 50 mol%, in particular up to 20 mol%, based on the monomers with the structural groups according to the formulae I, II, III and IV, of a vinyl- or (meth)acrylic acid derivative are also copolymerised.

15. Process according to any one of claims 12 to 14, characterised in that polymerisation is carried out in aqueous solution at a temperature of from 20 to 100 °C.

16. Process according to claim 15, characterised in that the concentration of the aqueous solution is from 30 to 50% by weight.

17. Process according to any one of claims 12 to 14, characterised in that polymerisation is carried out without solvent using a radical initiator at temperatures of from 20 to 150 °C.

18. Use of the copolymers according to any one of claims 1 to 11 as an additive for aqueous suspensions based on mineral or bituminous binders, in particular cement, gypsum, lime, anhydrite or other binders based on calcium sulphate, and also based on powder dispersion binders.

19. Use of the copolymers according to claim 18, characterised in that they are used in a quantity of from 0.01 to 10% by weight, preferably from 0.1 to 5% by weight, based on the weight of the mineral binder.